

WHAT IS CLAIMED IS:

1.           A radiation detector comprising:  
              a plurality of radiation detector elements  
each having a rod-shaped first electrode, a  
semiconductor device which surrounds an ambience of  
said first electrode and is come into contact with said  
first electrode and into which a radiation enters, and  
a second electrode provided for a side surface of said  
semiconductor device; and  
              a signal processing integrated circuit for  
processing radiation detection signals which are  
outputted from said radiation detector elements.
2.           A detector according to claim 1, further  
comprising:  
              a plurality of holding portions to detachably  
hold said radiation detector elements;  
              a first electric connecting portion which is  
come into contact with said first electrode; and  
              a second electric connecting portion which is  
come into contact with said second electrode.
3.           A detector according to claim 1, wherein said  
second electrode is provided so as to surround said  
side surface around said semiconductor device and said  
first electrode, said semiconductor device, and said  
second electrode are coaxially arranged.
4.           A detector according to claim 1, wherein a  
collimator in which a plurality of radiation paths  
provided in correspondence to said plurality of

radiation detector elements are formed is arranged on the radiation entering side of said plurality of radiation detector elements.

5. A detector according to claim 4, wherein said plurality of radiation paths are radially arranged in said collimator and said radiation detector elements are arranged so that a longitudinal direction of said radiation detector element is located on an extension line of said radiation path.

6. A plurality of radiation detector elements each comprising:

a rod-shaped first electrode;

a semiconductor device which surrounds an ambience of said first electrode and is come into contact with said first electrode and into which a radiation enters; and

a second electrode provided for a side surface of said semiconductor device,

wherein a part of said first electrode is projected from an edge surface of said semiconductor device where said second electrode is not provided.

7. Elements according to claim 6, wherein said second electrode is provided so as to surround said side surface around said semiconductor device and said first electrode, said semiconductor device, and said second electrode are coaxially arranged.

8. A radiation detector element comprising:  
a plurality of semiconductor devices into

which a radiation enters and which are arranged in parallel with a direction which perpendicularly crosses an incident direction of said radiation;

a first electrode which is arranged between said adjacent semiconductor devices and is come into contact with each of first side surfaces of said semiconductor devices which face each other; and

a second electrode which is come into contact with each of second side surfaces of said adjacent semiconductor devices which are located in said crossing direction,

wherein said first electrode is projected from one edge surface locating in said incident direction of said semiconductor device.

9. An element according to claim 8, wherein a width of said first electrode is narrower than that of said second electrode.

10. A radiation detector comprising:

said plurality of radiation detector elements according to claim 6 or 8, in which one of said first electrode and said second electrode is a signal output electrode for outputting a radiation detection signal and the other electrode is a voltage applying electrode;

an element holding member which detachably holds said plurality of radiation detector elements and has a plurality of first electric connecting portions which are come into contact with said signal output

electrode and a plurality of second electric connecting portions which are come into contact with said voltage applying electrode;

an integrated circuit for processing the radiation detection signal outputted from said signal output electrode of each of said plurality of radiation detector elements; and

an integrated circuit holding member on which said integrated circuit is arranged,

wherein said element holding member has a plurality of first connector portions separately connected to said plurality of first electric connecting portions and a second connector connected to each of said plurality of second electric connecting portions, and

said integrated circuit holding member has a plurality of third connector portions which are connected to said integrated circuit and are separately and detachably attached to said plurality of first connector portions and a fourth connector portion which is detachably attached to said second connector and applies a voltage.

11. A detector according to claim 10, wherein a collimator in which a plurality of radiation paths provided in correspondence to said plurality of radiation detector elements are formed is arranged on the radiation entering side of said plurality of radiation detector elements.

12. A detector according to claim 11, wherein said plurality of radiation paths are radially arranged in said collimator and said radiation detector elements are arranged so that a longitudinal direction of said radiation detector element is located on an extension line of said radiation path.

13. A detector according to claim 11, wherein said element holding member has a plurality of holding portions to detachably hold said radiation detector elements and said first electric connecting portion and said second electric connecting portion are provided for each of said holding portions.

14. A detector according to claim 13, wherein in said holding portion, a first hole portion in which a portion including said semiconductor device of said radiation detector elements is inserted and a second hole portion in which a projecting portion of the first electrode of said radiation detector element is inserted are serially arranged, one of said first electric connecting portion and said second electric connecting portion is arranged in said first hole portion, and the other electric connecting portion is arranged in said second hole portion.

15. A radiation detector comprising:

a shield which shields the radiation and has a plurality of through-holes;

said radiation detector elements according to claim 6 or 9 arranged in each of said through-holes;

and

an element holding member to which said radiation detector elements are detachably attached.

16. A detector according to claim 15, wherein a first electric connecting portion which is come into contact with said first electrode is provided for said element holding member and a second electric connecting portion which is come into contact with said second electrode is provided in each of said through-holes of said shield.

17. A detector according to claim 16, further comprising:

an integrated circuit for processing a radiation detection signal outputted from said signal output electrode of each of said plurality of radiation detector elements;

an integrated circuit holding member on which said integrated circuit is arranged,

wherein said element holding member has a plurality of first connector portions separately connected to said plurality of first electric connecting portions and a second connector connected to each of said plurality of second electric connecting portions, and

said integrated circuit holding member has a plurality of third connector portions which are connected to said integrated circuit and are separately and detachably attached to said plurality of first

connector portions and a fourth connector portion which is detachably attached to said second connector and applies a voltage.

18. A detector according to claim 15, wherein a length of said shield in an axial direction of said through-hole is equal to or longer than that in said axial direction of said semiconductor device of said radiation detector elements.

19. A detector according to claim 15, wherein a length of said shield in an axial direction of said through-hole is shorter than that in said axial direction of said semiconductor device of said radiation detector elements.

20. A radiation imaging apparatus comprising:  
a plurality of radiation detector elements each having a rod-shaped first electrode, a semiconductor device which surrounds an ambience of said first electrode and is come into contact with said first electrode and into which a radiation enters, and a second electrode provided for a side surface of said semiconductor device;

a signal processing integrated circuit for processing radiation detection signals which are outputted from said radiation detector elements; and

an image information forming apparatus for forming image information by using information which is outputted from said signal processing integrated circuit.

21.           A radiation imaging apparatus comprising:  
              a shield which shields the radiation and has  
a plurality of through-holes;  
              said radiation detector elements according to  
claim 6 or 9 arranged in each of said through-holes;  
              an element holding member to which said  
radiation detector elements are detachably attached;  
              a signal processing integrated circuit for  
processing radiation detection signals which are  
outputted from said radiation detector elements; and  
              an image information forming apparatus for  
forming image information by using information which is  
outputted from said signal processing integrated  
circuit.